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Attorney's Docket No.: 2571/USAMA 01/TCG/GCM/LE

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
 )  
Pravin K. Narwankar et al. )  
 )  
Serial No.: 09/096,858 )  
 )  
Filed: June 12, 1998 )  
 )  
For: USE OF RPS TECHNOLOGY FOR )  
1) ANNEALING HIGH K DIELECTRIC )  
2) DEPOSITING OF HIGH K DIELECTRIC )  
WITH ACTIVE ANIONIC SPECIES )

Examiner: Mai, Anh D.

Art Unit: 2814

RECEIVED  
APR - 2 2002  
TECHNOLOGY CENTER 2800

Assistant Commissioner  
for Patents  
Washington, D.C. 20231

DECLARATION UNDER 37 C.F.R. § 1.131

Sir:

I, Pravin K. Narwankar, declare as follows:

(1) I am an inventor of the claims of the above-captioned application ("the Application") and an inventor of the subject matter described therein.

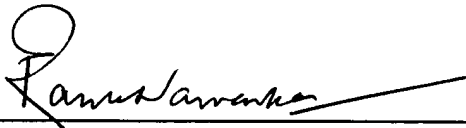
(2) At least prior to March 16, 1998, the invention claimed in the Application had been conceived and reduced to practice in this country.

(3) As evidence of invention attached hereto as Exhibit A is an Applied Materials Invention Alert Form entitled: "Use of RPS Technology for 1) Annealing High K Dielectric 2) Depositing of High K Dielectric with Active Anionic Species", which in its unredacted form, is dated prior to March 16, 1998.

(4) All statements contained herein made of my own personal knowledge are true and all statements made herein on information and belief is believed to be true. I am informed and understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

Date: 3/14/02

  
\_\_\_\_\_  
Pravin K. Narwankar

Circle Only One Area of Technology  
Applicable to This Invention:

Metal CVD	AIT	Microcontamination
HDP CVD	PVD	HDP Etch
DCVD	Platform	SHO Etch
<u>RTP</u>	HTF	Metal Etch
TFT/AKT	CMP	AMIL

### INVENTION ALERT FORM

(Please use separate attachments for any answers that don't fit on the form, especially for questions 6-8. If the answer to a question is "none", please write "none" rather than leaving the answer blank.)

1. Today's Date: \_\_\_\_\_
2. Title of Invention: USE OF RPS TECHNOLOGY FOR  
~~FOR SMT~~ ① Annealing high k dielectric ② depositing high k dielectric with active anionic species
3. Provide the following information for EACH inventor:

#### Inventor #1

Name: ANKINEEDU VELAGA  
Telephone: 408-253-9194  
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Citizenship: US  
Home Address: 10180 PARKWOOD DR., #7  
CUPERTINO, CA 95014  
Boss's Name: TURGUT SAHIN  
Boss's Job Title: PROGRAM MANAGER  
His/Her Boss's Name: JAMES TIETZ  
His/Her Boss's Job Title: DIRECTOR  
Product Group: CAPACITOR / RTP

Inventor #2

Name: ~~PRADIP K. NARWANKAR~~ PRAVIN K. NARWANKAR  
Telephone: 408-737-1590  
Job Title: Member of Technical Staff  
Citizenship: INDIA  
Home Address: 392 Waring Street,  
Sunnyvale, CA 94086  
Boss's Name: ANKINEEDU VELAGA  
Boss's Job Title: JDP & Integration Manager  
His/Her Boss's Name: TURGUT SAHIN.  
His/Her Boss's Job Title: Capacitor Program Manager.  
Product Group:

Inventor #3

Name: TURGUT SAHIN.  
Telephone: 408-257-6542  
Job Title: Program Manager  
Citizenship: USA  
Home Address: 1110 Chadwick Pl.  
Cupertino, CA 95014  
Boss's Name: Jim Tietz  
Boss's Job Title: Program Director  
His/Her Boss's Name: Chris Gronet  
His/Her Boss's Job Title: General Mgr, RTP  
Product Group: Capacitor Program / RTP

Inventor #4

Name: ~~RANDALL S. URDAHL~~ Urdahl  
Telephone: (408) 563-7722  
Job Title: Process Engineer  
Citizenship: USA  
Home Address: 3898 Magnolia Drive, Apt. 12  
Palo Alto, CA 94306  
Boss's Name: Turgut Sahin  
Boss's Job Title: Capacitor Program Manager  
His/Her Boss's Name: James Tietz  
His/Her Boss's Job Title: Director  
Product Group: RTP

4. Earliest dates and model names of all Applied products incorporating the invention which have been offered for sale or are expected to be offered for sale.

5. If the invention has been demonstrated or described to persons other than Applied employees, for each disclosure please provide the earliest date, name of company, and brief description of what information was disclosed and the purpose of the disclosure.

Ta<sub>2</sub>O<sub>5</sub> annealing using RPS O<sub>2</sub> + N<sub>2</sub> mixture was demonstrated to Lucent.

Electrical data was gathered at customer site hence process details were disclosed.

6. If disclosures as in question (4) are expected to occur within the next 12 months, please provide the anticipated date, type of information, and purpose of the disclosure.

As the process will be a potential ~~per~~ BKM process it would have to be disclosed to the customers

7. Describe the invention, preferably with reference to drawings.

An innovative process to anneal thin films of dielectric material at low temperatures (< 400°C). This process is applicable for a host of dielectric materials ~~among~~ an of those currently used for high k applications for capacitor technology which include: Ta<sub>2</sub>O<sub>5</sub>; TiO<sub>2</sub>; BST; PZT; ONO; NO; Ti doped Ta<sub>2</sub>O<sub>5</sub> etc.

8. List each feature of the invention which you consider novel and non-obvious. Describe the advantages of each novel feature in comparison with the state-of-the-art approaches which are closest to your invention.

- ① Annealing at temperatures  $< 400^{\circ}\text{C}$  for most dielectric materials. This temperature is  $<$  deposition temperature.
- ② RPS could be used during the deposition process itself thus eliminating the annealing step.

9. Describe any other known designs, or processes, whether actually implemented or merely proposed in a publication, which could be considered similar to your invention or which constitute the state-of-the-art which your invention improved upon.

10. Signature, date, and printed name of each inventor plus two witnesses who have read and understood this Invention Alert form.

<del>Pravin K. Nanwankar</del>	Pravin K. Nanwankar
<del>Turgut Sahin</del>	Turgut Sahin
<del>V. Anand</del>	ANKINEBOU VELAGU